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David E. Black

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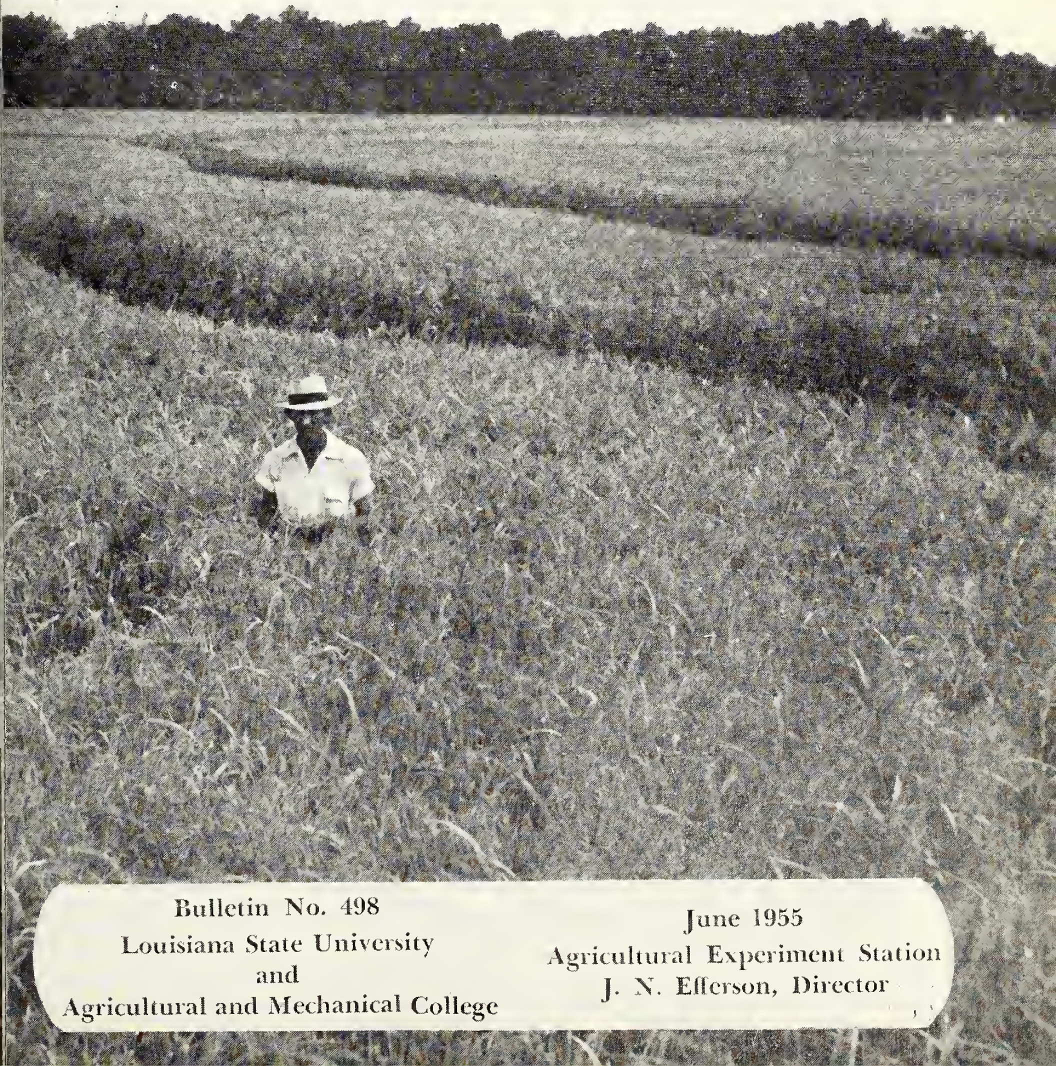
by David E. Black and R. K. Walker



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The Value of Pastures in Rotation With Rice

DAVID E. BLACK AND R. K. WALKER

INTRODUCTION

The major portion of the Louisiana rice industry is located in the coastal prairie area of southwest Louisiana and comprises chiefly seven parishes that produce 89 per cent of the rice grown in the state. The agricultural economy of this section is built almost exclusively on the production of rice and beef cattle.

Because of the present practices of short-time rotation, low rate of fertilization and the flooding and draining associated with rice cultivation, the soils have become particularly low in organic matter, nitrogen and phosphorus (7, 8) *. In some cases the soils are so infertile that rice yields are less than 35 bushels per acre. This yield is not considered high enough for profitable rice farming.

The most common rotation practice is to plant half the farm to rice each year, with the other half being used as native pasture for beef cattle. It requires from five to six acres of this native or weedy fallow type of pasture plus rice stubble and some concentrate feed to support one mature animal. Beef production per acre is approximately 50 pounds annually (2). This practice when continued year after year results in poor livestock returns, lower rice yields and a general reduction in the fertility of the rice soils. Some farmers find it more profitable to graze their land for two years before planting it back to rice, while a few graze as long as three or four years.

Because of the noncompetitive nature of rice and beef cattle production, these two enterprises fit very well together and one tends to add to or supplement the other. It has been known for years (1) that a sound rotation program of pastures with other crops tends to build up soil organic matter, available nitrogen, and other plant nutrients. With the increasing need for more and better livestock feed in this area, a rotation system of improved pastures with rice seemed to be the logical approach to increasing the rice yields and building up the general fertility level of the rice soils. Therefore a series of experiments along this line was begun in 1938 and continued to date. A report of the early work up to 1945 is presented in Louisiana Experiment Station Bulletin 407, "A Twelve-Month Grazing Program for the Rice Area of Louisiana."

Information on the value of improved pastures in rotation with rice is somewhat limited. However, earlier work done in Louisiana, 1939 - 1945 (2), showed that good results could be obtained by the use of improved pastures. Beef yields were increased from approximately 50

* Figures in parentheses refer to "Literature Cited."

pounds to 250 pounds per acre and rice yield increases following improved pastures varied from 6.4 to 11.1 barrels per acre. Weihing, Moncrief, and Davis report (3) that beef yields on fallow land were 46.9 pounds per acre, while improved pastures produced 181.7 pounds per acre and rice yields following three years of improved pastures averaged 17.72 barrels per acre as compared to 15.23 barrels per acre on land planted to rice every other year with no pasture improvement. Davis reports (4) a commn rotation that is followed on lighter soils in California is rice, beans, wheat, beans and again to rice. Jones *et al.* (5) report that attempts have been made at the Biggs Rice Field Station to grow cultivated crops such as corn, grain sorghums, cotton and beans in rotation with rice, but profitable crops have not been produced. They also state that with good stands the yields of rice on improved pasture lands are relatively high, but the most common rotation in California is to alternate a rice crop and fallow, with such idle lands often being pastures. Nelson reports (6) that a two-year rotation of rice with soybeans harvested as hay or beans, or turned under for soil improvement, is more desirable than rice rotated with fallow because no income is produced from the land the year in which it is fallowed. Many crops used in some other states are not grown in rotation with rice in southwest Louisiana because they are not adapted to the climatic and soil conditions existing in this area. Improved pastures accompanied by supplemental grazing crops such as oats, wheat, rye grass, lespedeza and clovers have proved to be more desirable for rotation with rice in Louisiana.

EXPERIMENTAL PROCEDURE

A five-year rotation experiment was established at five locations from 1946 to 1953 on four different soil types in the rice area, in a continuation of the investigations begun in 1938. The purpose of these experiments was to determine the effects of improved pasture compared with native pastures on rice and beef yields and, at the same time, determine whether a year-round grazing program for maximum beef production in a pasture-rice rotation was practical. The plan consisted of three years in pasture followed by two in rice. The individual experiments included three treatments, with two or three replications of each treatment, replicates in the experiments at the different locations varying in size from five to ten acres. The three initial pasture treatments were as follows:

(1) Improved pasture. This pasture was limed where necessary to bring the pH to 6.2, fertilized with 400 pounds of 3-12-12 fertilizer per acre. It was seeded with 5 pounds of white clover, 10 pounds of common or 15 pounds of Kobe lespedeza and 16 pounds of Dallis grass per acre. Bermuda grass is native and volunteered in all pastures. Two hundred pounds of 3-12-12 fertilizer per acre was applied as topdressing in the fall of the second and third year.

Top picture: Heavily grazed improved pasture. (Photo taken April 27, 1948, on the Joe Zaunbrecher farm, Gueydan, La.) Bottom picture: Check pasture, showing native weeds and grass commonly found in the rice area.

(2) Oats-lespedeza supplementary pasture and hay crop. This pasture was fertilized each fall with 300 pounds of 5-10-5 fertilizer per acre and seeded with three bushels of oats per acre. Thirty-two pounds of nitrogen per acre was added as a topdressing about February 15, at which time the oats were over-planted with Kobe lespedeza at the rate of 25 pounds per acre.

(3) Check or unimproved pasture. This pasture was not plowed, seeded or fertilized, but was fallow to native weeds and grasses. All pastures were mowed when necessary to control weeds.

The pastures were grazed for three years with as many cattle as they would support and for as long a period as normal grazing was available. Cattle weights were recorded every 30 days.

After three years of grazing, all of the plots were plowed in early winter and planted to rice the following spring. One replication of each pasture was planted to rice in six plots. Three of the six plots planted to rice were fertilized with 200 pounds of 4-12-8 fertilizer per acre. Three plots were planted to rice but not fertilized. These plots were planted for two years and rice yields from fertilized and non-fertilized plots after pasture were obtained.

EXPERIMENTAL RESULTS

Rice Experiment Station, Crowley, Louisiana

This experiment was begun in 1949 on Crowley silt loam at Crowley, Louisiana. There was a total of 45 acres in the test, with three replications of five acres each and three treatments as indicated above. Grazing data are presented in Table 1. The average number of grazing days per year for the check pasture was 201, while that of the improved pasture was 243 days. The difference in grazing days was comparatively less than the difference in carrying capacity, which was 0.22 animal units* per acre for the check pasture and 0.54 for the improved pasture. The three-year average beef production per acre per year was 45 pounds on the check pasture and 224 on the improved pasture.

The seasonal distribution of beef gains is presented as an average for three years in Figure 1. Grazing on improved pastures began each year between February 16 and February 26, while on the check pastures grazing was not available until one to two months later. The beef production per acre on the improved pastures was high during the months of March, April and May owing to the excellent growth of white clover during this period. A sharp decline occurred in June, a period during which dry weather is usually encountered and clover growth is halted. The lespedeza and Dallis grass coming in after the peak of the clover growth tended to stabilize beef production around 15-20 pounds per acre per month until October 1, when better moisture conditions

* "Animal units" represents 1,000 pounds of animal weight.

TABLE 1.—Summary of grazing data from pastures at five locations, 1946 - 1952

Location of Experiment	Pasture	Days grazing per year				Average number animal units grazed per acre				Beef production—lbs. per acre			
		First year	Second year	Third year	Three year average	First year	Second year	Third year	Three year average	First year	Second year	Third year	Annual average
Rice Experiment Sta.	Check	242	169	201	201	.18	.27	.20	.22	49	60	27	45
	Improved	254	217	260	243	.44	.56	.62	.54	126	284	264	224
E. O. Daughenbach	Check	67	133	128	109	.69	.35	.24	.43	−6	73	49	40
	Improved	110	238	165	171	.65	.54	.46	.55	230	265	227	240
Karl Goebel	Check	51	74	204	110	.26	.26	.30	.27	58	36	81	58
	Improved	110	223	255	196	1.11	.63	.74	.82	235	403	432	356
Joe Zaunbrecher	Check	...	84	61	73	...	.22	.27	.24	...	45	27	36*
	Improved	...	144	213	178	...	.45	.53	.49	...	160	208	184*
A. M. Moore	Check	...	220	75	148	...	.45**	.30	.38	...	52	49	51*
	Improved	...	220	153	187	...	1.00**	.57	.79	...	367	327	347*
Average	Check	120	136	133	130	.37	.28	.26	.30	36	53	46	46
	Improved	158	208	209	192	.73	.54	.58	.63	197	295	292	271

* Two-year average.

** Animals per acre. Data on animal units per acre not available.

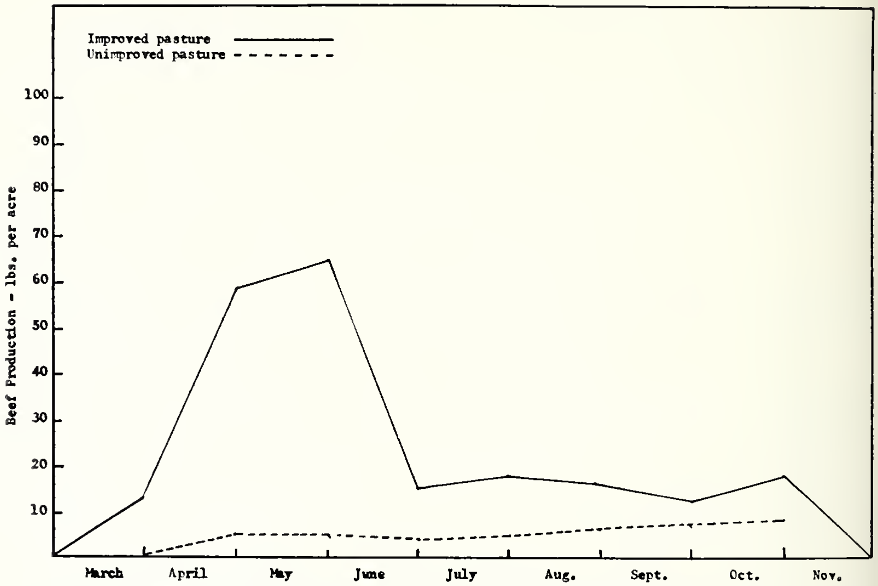

FIGURE 1.—Seasonal distribution of beef gains from pastures on Crowley silt loam at the Rice Experiment Station, Crowley, Louisiana, 1950 - 1952.

Improved pasture after 360 days continuous grazing on the Rice Experiment Station, Crowley, La. (Photo taken Jan. 25, 1955.)

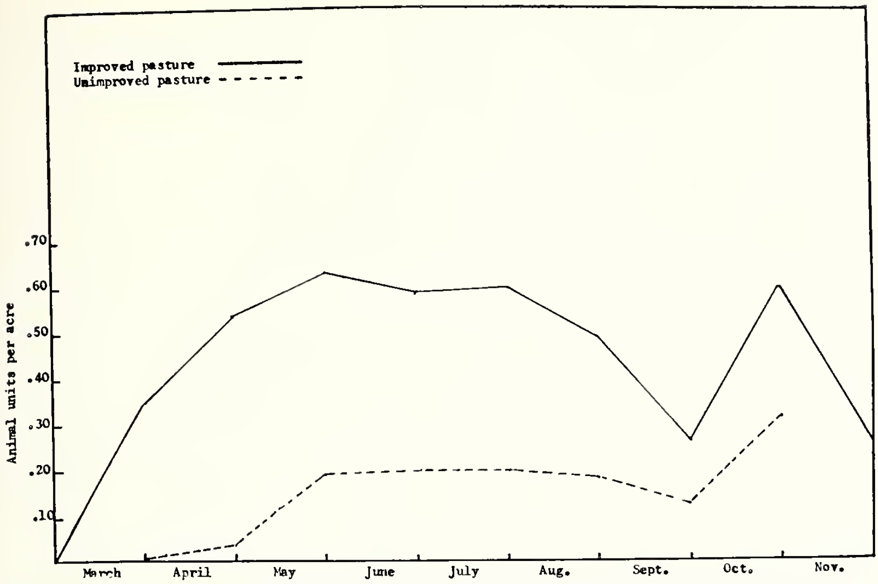

FIGURE 2.–Seasonal distribution of grazing capacity of pastures on Crowley silt loam at the Rice Experiment Station, Crowley, Louisiana, 1950 - 1952.

caused a slight increase in production. The beef production on the check pastures, although extremely low, did not vary from month to month as much as on the improved pastures. The average grazing capacities for the three-year period, in animal units per acre, of each of the two pastures are presented in Figure 2 and show the same general trend as beef production per acre presented in Figure 1.

The oat-lespedeza pasture was used for supplementary grazing and grain production for feed during pasture shortages during both summer and winter and also for hay production to further supplement grazing during the winter months. Oats were grazed an average of 81 days per year with 0.55 animal units per acre, and the production of beef was 55 pounds per acre per year for the three-year period. Year-round grazing was obtained during two of the three years from a combination of improved pasture and supplementary pasture. During one year the combination of improved pasture and oat-lespedeza supplementary pasture supported one animal per acre for nine months and 0.7 animal per acre for three winter months, with the animals gaining an average of 1.4 pounds per acre per day for the entire year. An average of 27.6 bushels of oats and 1.5 tons of lespedeza hay per acre per year were harvested from these plots in addition to the beef produced from grazing.

Rice yields following these pastures are shown in Table 2. For the first year the yield of fertilized rice following improved pastures was 22.91 barrels per acre as compared to 18.96 for the non-improved pastures. The

TABLE 2.–Summary of rice yields following pastures at four locations, 1946-1952

Location of Experiment	Yield of rice, bbls. per acre–dry weight (14% moisture)							
	Following improved pasture				Following check pasture			
	200 lbs. per acre 4-12-8		No fertilizer used		200 lbs. per acre 4-12-8		No fertilizer used	
	First year	Second year	First year	Second year	First year	Second year	First year	Second year
Karl Goebel	26.03	16.82	25.00	15.38	22.20	14.90	20.60	14.01
Joe Zaunbrecher	23.64	16.27	22.60	14.91	18.35	11.84	17.75	10.26
A. M. Moore	19.20	16.00	19.00	16.02	15.30	11.80	13.00	10.83
Rice Experiment Station	22.91	12.44	23.31	11.73	18.96	14.02	16.28	11.90
Average	22.94	15.38	22.47	14.51	18.70	13.14	16.90	11.75
Average yield increase from fertilizer	0.47	0.87			1.80	1.39		
Average yield increase from sod and fertilizer	6.04	3.63						

Top picture: Winter grazing on oat pasture at the Rice Experiment Station, Crowley, La. Bottom picture: Winter grazing on rice stubble. (Both photos taken Jan. 25, 1955.)

fertilizer had no effect on the rice yield following improved pastures but it increased rice yield following the unimproved pastures by 2.68 barrels. The rice after improved pastures produced 7.03 barrels per acre more than rice after the unimproved pastures. The second year rice yields were very low and data are not considered to be of any value because of poor stands and heavy weed and grass infestation.

E. O. Daughenbach Farm, Lake Charles, Louisiana

This experiment was begun in the summer of 1948 on Lake Charles silty clay loam at Lake Charles, Louisiana. The experimental area consisted of 48 acres and included three treatments with two replications. The treatments were the same as outlined in the experiment at Crowley. Grazing data are presented in Table 1. The average number of days of grazing per year over the three-year period was 109 for the check pasture and 171 for the improved pasture. There was a loss of six pounds of beef per acre during the first year of grazing on the check pasture, while the improved pasture produced 230 pounds of beef per acre. The three-year average gain from the check pasture was 40 pounds per year, while the improved pasture produced 240 pounds of beef per acre per year.

The seasonal distribution of beef gains per acre (Figure 3) on the improved pasture shows the same general curve as at the Crowley location, with high production in April and May followed by low production in July and August. The check pasture furnished no grazing in any of

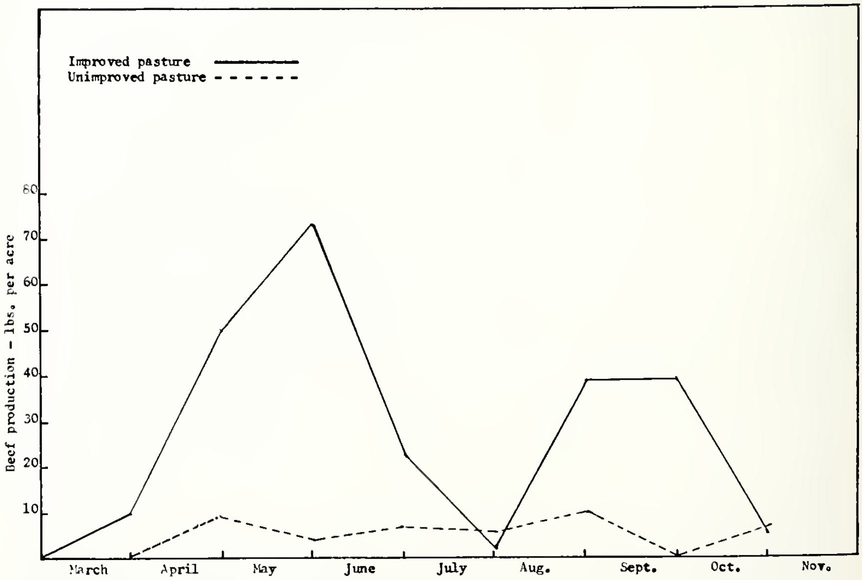

FIGURE 3.—Seasonal distribution of beef gains from pastures on Lake Charles silty clay loam at E. O. Daughenbach's farm, Lake Charles, Louisiana, 1949 - 1951.

the three years during the month of September. The seasonal distribution of grazing capacity is shown in Figure 4, and the curve follows the same general trend as the beef production per month curve.

The supplemental pastures of oats were not successful because of the poor drainage condition of the area. Only a limited amount of grazing was obtained during one year of the test. The lespedeza in the oat-lespedeza pasture produced approximately two tons of hay per acre during the first two years and 2.6 tons per acre the third year. Data on rice yields following pastures at this location were not of sufficient reliability to present. The erratic yields of rice were due to poor stands, weed and grass infestation and 2,4-D damage.

Karl Goebel Farm, Elton, Louisiana

This experiment was planted in December 1946 on Crowley silt loam at Elton, Louisiana. It included a total of 55.2 acres, with two replications of 9.2 acres of the same three treatments used in the above experiments. Grazing data in Table 1 show an average of 110 days of grazing per year for the check pastures and 196 days for the improved pastures, while the average number of animal units grazed per acre were 0.27 and 0.82 respectively. Average beef production per acre per year was 58 pounds for the check pasture and 356 pounds per acre for the improved pasture. The seasonal distribution of beef gains (Figure 5) and the

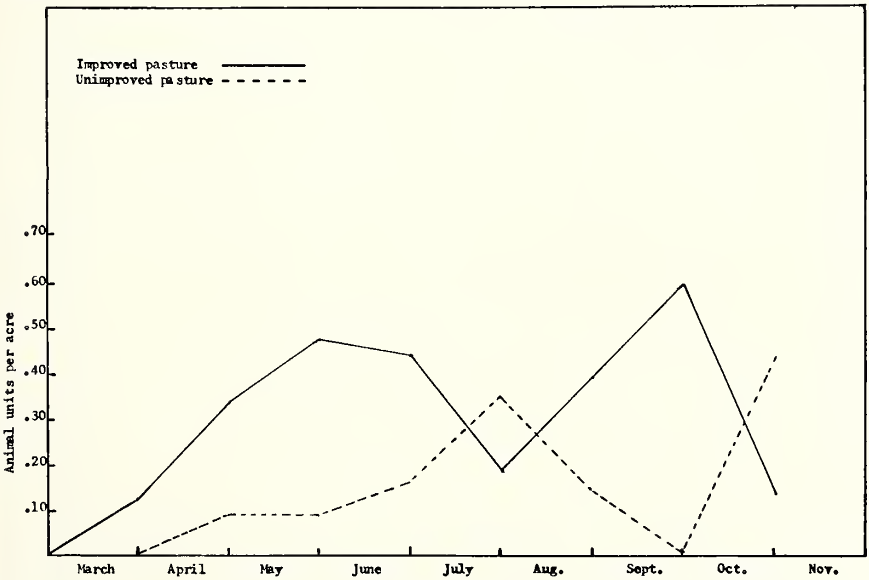

FIGURE 4.—Seasonal distribution of grazing capacity of pastures on Lake Charles silty clay loam at E. O. Daughenbach's farm, Lake Charles, Louisiana, 1949 - 1951.

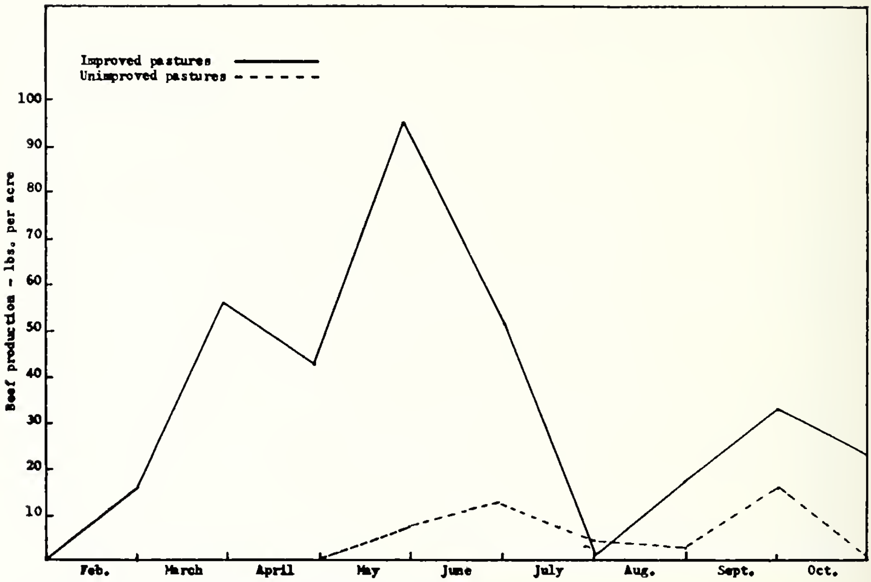

FIGURE 5.—Seasonal distribution of beef gains from pastures on Crowley silt loam at Karl Goebel's farm, Elton, Louisiana, 1947 - 1949.

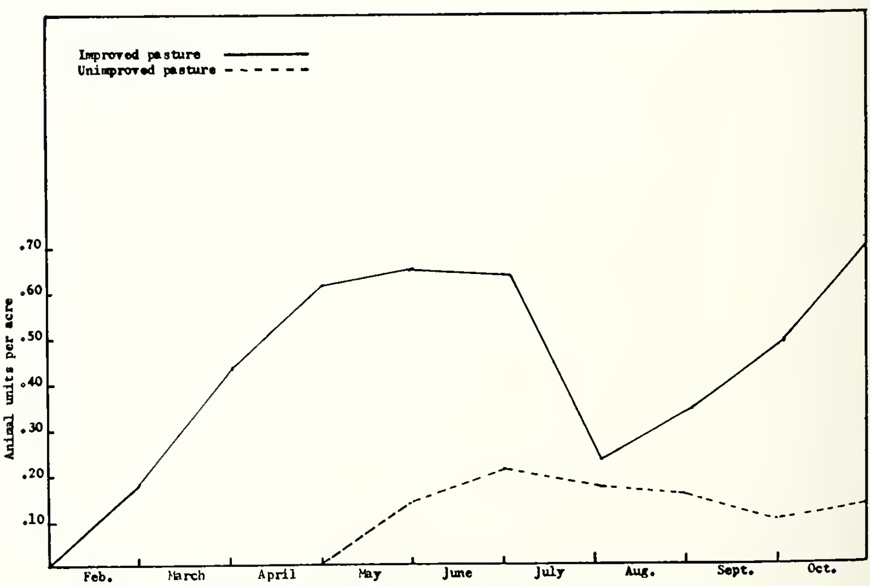

FIGURE 6.—Seasonal distribution of grazing capacity of pastures on Crowley silt loam at Karl Goebel's farm, Elton, Louisiana, 1947 - 1949.

grazing capacity per month (Figure 6) show the same general trend as in the other two experiments, except both were somewhat higher. The rice production history of this soil indicated that the general fertility level was considerably higher than that of the other experiments. This was reflected in both higher beef yields from the pastures and rice yields following the pastures.

Continuous grazing on the oat pastures could not be obtained because of the wet and muddy condition of the fields. The three-year average grain yield was 11.1 bushels per acre, and beef production on oat-lespedeza pastures was 98.7 pounds per acre per year. Hay yields of lespedeza were 0.7 tons per acre per year.

One replication of each treatment of this experiment was planted to Zenith rice in 1950 and 1951. Each pasture was divided into six plots of 1.53 acres each, three of which were fertilized with 200 pounds of 4-12-8 per acre and three were not fertilized. Rice yields in 1950 following these pastures are shown in Table 2. Rice after the improved pasture produced 25.0 barrels per acre as compared to 20.6 barrels after the check pasture. The fertilizer was more effective on rice following check pasture than on rice after the improved pasture. The increases in yield due to fertilizer were 2.4 and 1.03 barrels per acre respectively. The increase in yield due to improved pasture sod and fertilizer was 5.43 barrels per acre. These plots planted to rice in 1950 were planted again to rice in 1951 and fertilized in the same manner. Rice yields from all plots, as shown in Table 2, were considerably lower in 1951 than in 1950. The non-fertilized plots after pasture produced 15.38 barrels per acre the second year as compared to 25.0 barrels per acre for the first year following improved pastures. The increase in yield of rice from sod and fertilizer was only 2.81 barrels per acre in 1951 as compared to 5.43 barrels for 1950. The fertilizer on the rice after improved pasture plots was more effective in 1951 than in 1950. The increases due to fertilizer were 1.44 and 1.03 barrels of rice per acre for 1951 and 1950 respectively.

Joe Zaunbrecher Farm, Gueydan, Louisiana

The pastures in this experiment were planted in 1946 on Lake Charles clay loam, Gueydan, Louisiana, in a field from which 5.5 barrels of rice per acre had been harvested in the fall of 1945. The experiment included 48 acres, with three treatments replicated twice. Each replicate was 8 acres in size. Lespedeza and Dallis grass were planted on the improved pasture plots in the late spring of 1946 and white clover was planted the following fall. No grazing was obtained the first year from the spring planted pastures so the average beef yields are for two years. The average number of days of grazing per year on the check pasture was 73 and that of the improved pasture was 178. Beef production on the improved pastures averaged 184 pounds per acre per year while that of the unimproved pasture was only 36 pounds per acre.

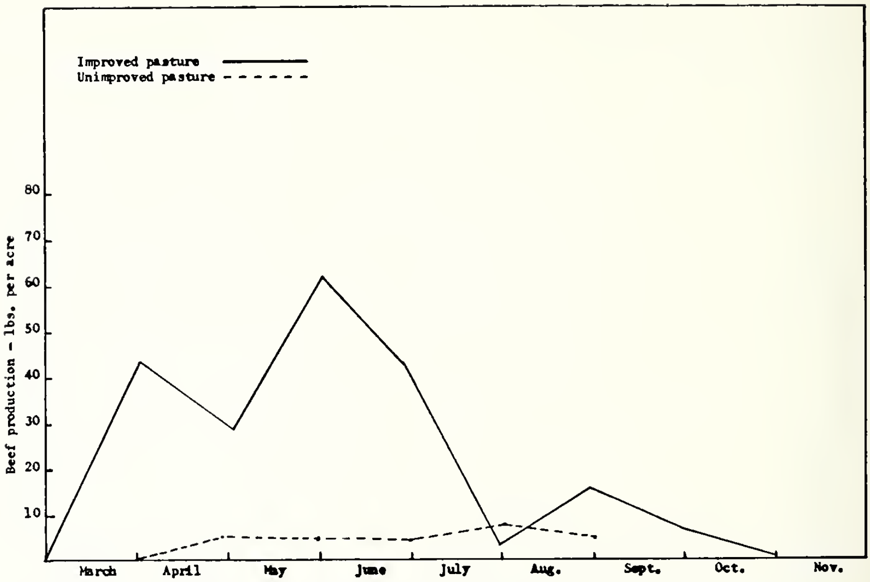

FIGURE 7.—Seasonal distribution of beef gains from pastures on Lake Charles silty clay loam at Joe Zaunbrecher farm, Gueydan, Louisiana, 1947 - 1948.

The seasonal distribution of beef production (Figure 7) and grazing capacity (Figure 8) on the improved pasture shows the same general trend as earlier experiments, with peak production in May and low production in July followed by moderate increase in production in August. Oat grazing in this experiment was not very successful owing to the poor drainage condition of the soil. In 1947 only 27 days of grazing were obtained by March 3, at which time the cattle were removed so that grain could be harvested. Thirteen pounds of beef and 23.7 bushels of grain per acre were produced on the oat plots and 69.7 pounds of beef per acre were produced on the lespedeza pasture. No grazing was obtained on oat plots in 1948 because of late planting; however, 28.3 bushels of grain per acre were harvested. The lespedeza produced 2.1 tons per acre.

One replication of each pasture was planted to Bluebonnet rice in 1949 and 1950. Yields are shown in Table 2. The production of rice following the improved pasture plots that received no fertilizer was 22.60 barrels per acre, while the yield following the check pasture was only 17.75 barrels per acre. The improved pasture sod and fertilizer increased rice yields 5.89 barrels per acre. In 1950, the second year in rice, yields were reduced approximately 7 barrels per acre on all plots; however, the increase in yield due to sod and fertilizer (Table 3) following the improved pasture plots was slightly higher. The fertilizer was more effective on all plots in 1950 than in 1949.

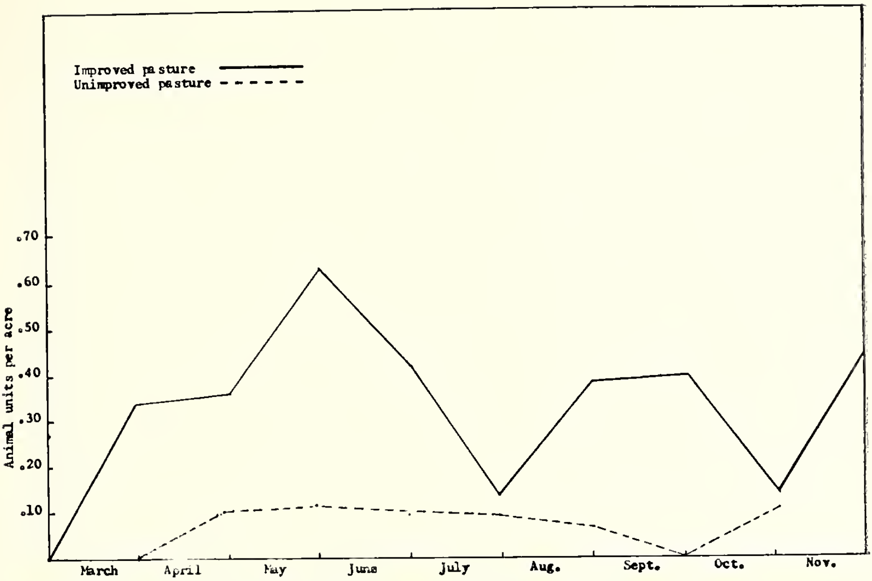

FIGURE 8.—Seasonal distribution of grazing capacity of pastures on Lake Charles silty clay loam at Joe Zaunbrecher farm, Gueydan, Louisiana, 1947 - 1948.

A. M. Moore Farm, Oberlin, Louisiana

This experiment was planted in the late spring of 1945 on Oberlin silt loam soil at Oberlin, Louisiana. The treatments were the same as used in other locations and consisted of two replications of ten acres each. No grazing was obtained the first year because of late spring planting; therefore data as presented in Table 1 are for a two-year period. The unimproved pasture produced 52 and 49 pounds of beef per acre the second and third year respectively, while on the improved pastures the yield was 367 pounds the second year and 327 pounds per acre during the third year.

Beef production on the oat plots was 60 pounds per acre for 1946 and 108 pounds per acre during 1947. No grazing was obtained on the lespedeza in 1946; however, 1.92 tons of hay per acre were harvested. In 1947 the oat plots produced 67 pounds of beef per acre and the yield of lespedeza was 0.8 ton per acre.

Rice yields following these pastures are shown in Table 2. There was little difference in the rice yields from the fertilized and non-ferti-
three barrels per acre on each of the pastures.
lized plots following the improved pastures for either 1948 or 1949 (Table 3). However, the fertilizer on rice following the check pasture produced an increase of 2.30 and 0.97 barrels per acre for the first and second years respectively. Rice yields following improved pasture were 19.0 barrels per acre the first year as compared to 13.0 barrels for the unimproved pasture. The second year the yields dropped approximately

Summary

A summary of grazing data for a three-year period at each of three locations and a two-year period at two locations is presented in Table 1. No grazing was obtained the first year at two locations because of late planting, dry weather and poor stands. Under actual farm grazing conditions higher beef gains probably would be obtained from all pastures at all locations under close management. Some grazing could have been obtained from the pastures at the two locations that were not grazed during the first year of establishment, by close management. This was not possible under experimental conditions because of the cooperating farmers having to purchase desirable animals for a short period of grazing in one year and because the distance from the Experiment Station made it impossible to regulate grazing as closely as by "on the farm" management. It is also possible that the number of days of grazing

TABLE 3.—Rice yield increases due to fertilizer and fertilizer and sod following pastures at four locations

Location of Experiment	Yield increase, bbls/A, due to					
	Fertilizer* on Improved Pastures		Fertilizer on Unimproved Pastures		Sod and Fertilizer	
	1st year	2nd year	1st year	2nd year	1st year	2nd year
Karl Goebel	1.03	1.44	1.60	0.89	5.43	2.81
Joe Zaunbrecher	1.04	1.36	0.60	1.58	5.89	6.01
A. M. Moore	0.20	−0.02	2.30	0.97	6.20	5.17
Rice Experiment Station	−0.40	0.71	2.68	2.12	6.63	0.54
Average	0.47	0.88	1.80	1.39	6.04	3.63

* Two hundred pounds of 4-12-8 per acre at all locations except Rice Experiment Station. This test received 125 pounds of 16-20-0 per acre.

could have been lengthened at all locations, as grazing was begun after a fairly good reserve was accumulated and was ended when the gains began dropping seriously in the fall. Some grazing can be obtained from improved pastures at intervals during the winter months. The average number of days of grazing on all experiments the first year was approximately two-thirds that of the second and third years. The three-year average was 130 days for the unimproved pasture as compared to 192 for the improved pasture. The average number of animal units grazed per acre was 0.30 and 0.63 for the unimproved and improved pastures respectively. Average beef production from the improved pastures was 271 pounds per acre as compared to 46 pounds per acre from the unimproved pasture.

The average seasonal distribution of gains per acre per day for all locations is presented in Figure 9. A small amount of grazing was obtained from the improved pastures in February, with production con-

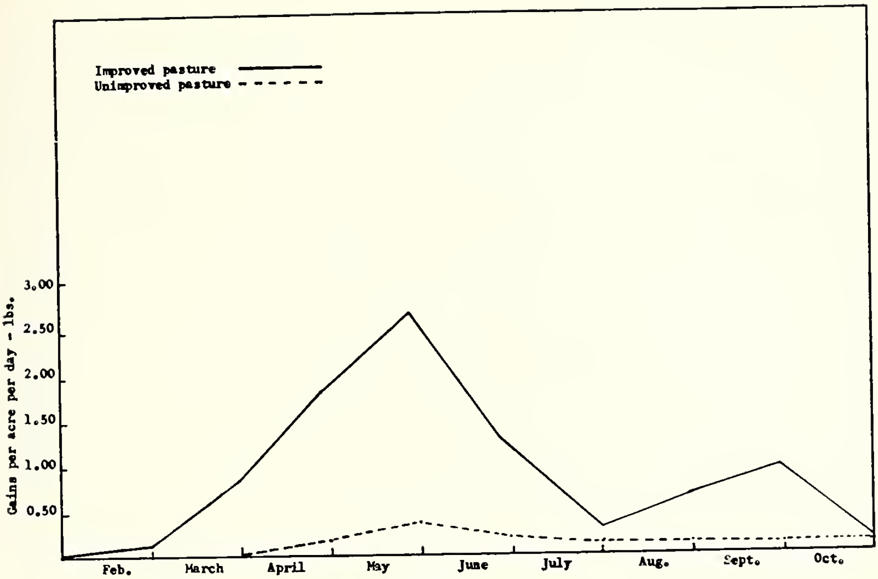

FIGURE 9.—Average seasonal distribution of beef gains from pastures at five locations, 1946 - 1952.

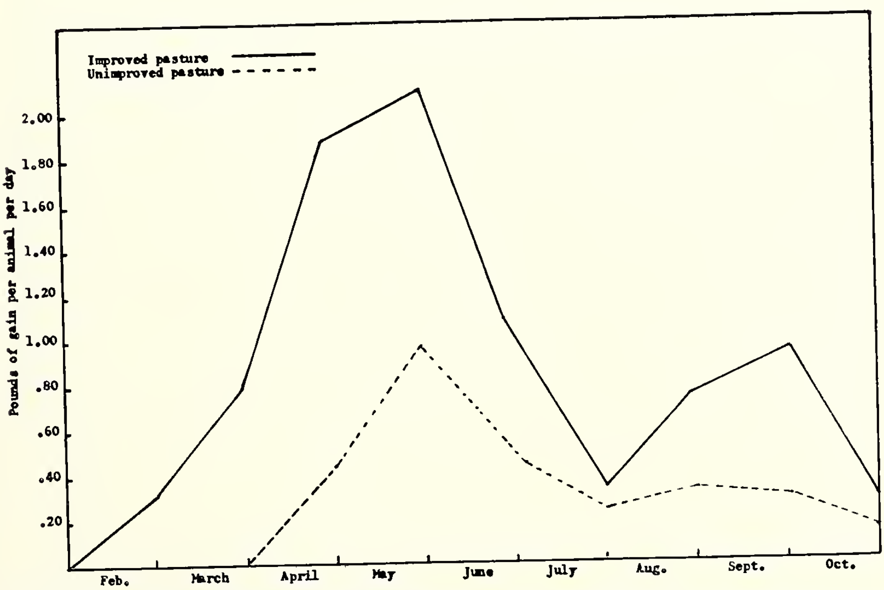

FIGURE 10.—Average seasonal distribution of gains per animal per day from pastures at five locations, 1946 - 1952.

tinuing to increase until the end of May, when it reached 2.62 pounds of beef per acre per day. This is the result of the vigorous growth of the white clover. By the end of May the clover began to disappear and dry and hot weather caused production to fall until the end of July, when a low of 0.21 pound per acre per day was produced. Production increased slightly in August and September and by the end of October practically all growth stopped.

The seasonal distribution of gains on the unimproved pasture shows the same trend as that of the improved pasture; however it was usually April 1 before any grazing could be obtained.

The pounds of gain per animal per day and the carrying capacity in animal units per acre are shown in Figures 10 and 11, respectively.

During the years in which oats were moderately grazed until February 15, beef production averaged 47.2 pounds per acre and grain yields averaged 23.9 bushels per acre. When no attempt was made to harvest grain, the grazing period was extended to approximately May 1 and the beef production was increased to 70.5 pounds per acre. The lespedeza produced an average of 1.84 tons of hay per acre when not grazed and 74.6 pounds of beef per acre when grazed. During the years when the lespedeza was moderately grazed for a portion of the season, the production was 67 pounds of beef and 0.8 ton of hay per acre.

A summary of rice yields following three years improved and non-improved pastures with and without fertilizer at four locations is shown in Table 2. The average yield the first year following improved pastures without any fertilizer applied to the rice was 22.48 barrels per acre

FIGURE 11.—Average seasonal distribution of grazing capacity of pastures at five locations, 1946-1952.

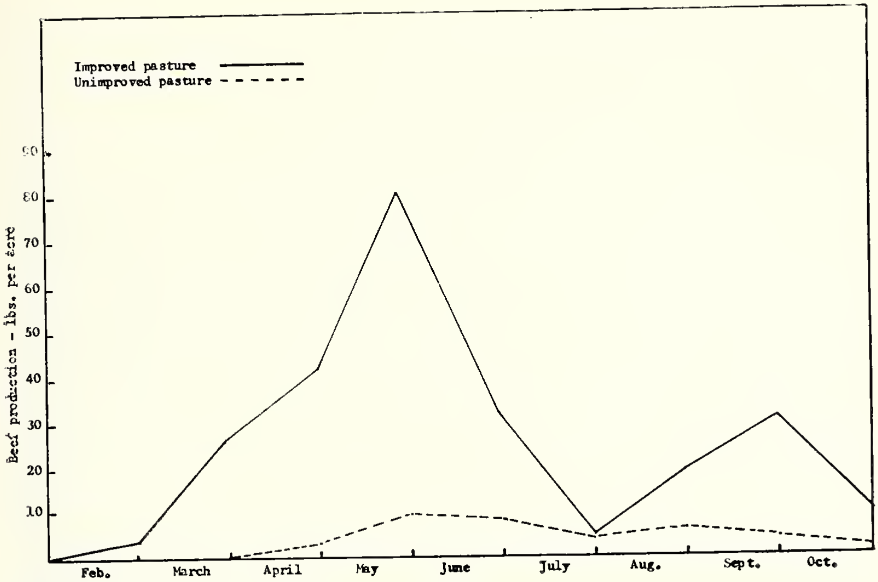

FIGURE 12.—Average seasonal distribution of gain from pastures at five locations, 1946 - 1952.

compared to 22.94 for the fertilized plots. This is an increase of only 0.46 barrel per acre. During the second year the increase in yield due to fertilizer was 0.88 barrel per acre. The average yield following the non-improved pastures with fertilizer was 18.70 barrels per acre and without fertilizer the yield was 16.90 barrels per acre. There was a reduction in yield of from 3 to 9.5 barrels per acre during the second consecutive year of rice on the improved and unimproved pastures from both the fertilized and non-fertilized plots.

A summary of rice yield increases due to fertilizer and fertilizer and sod following both the improved and unimproved pastures for the first and second year is shown in Table 3. This shows an average increase of 6.04 barrels per acre from sod and fertilizer for first year's plantings and 3.63 barrels per acre for the second year. Fertilizer on rice following the non-improved pastures increased the yield an average of 1.80 and 1.39 barrels per acre for the first and second years respectively.

DISCUSSION

The results of these five experiments tend to substantiate earlier work (2) that has been published on pasture rice rotation for southwest Louisiana.

White clover, Dallis grass, native Bermuda and lespedeza are a good pasture mixture for the rice area of Louisiana and when properly fertilized and limed, will produce good grazing from February 15 to Octo-

Oat grain crop after having been grazed until Feb. 15.

ber 15. No bloat trouble has been encountered in the use of this mixture.

An excess growth of forage occurs in April and May and a shortage of forage occurs in July and August. This poor growth in July and August is the result of dry weather. Excellent results were obtained in preventing this low production period in another pasture experiment at the Rice Experiment Station during 1954 by applying nitrogen approximately 5 inches deep with soil points followed by irrigation, as needed, to increase soil moisture to an optimum level.

The indications at present are that if improved pastures are established it is desirable to provide contour levees and irrigation during dry periods so that full benefits can be received from the relatively large investment required in establishment of good improved pastures.

The high initial cost of an improved pasture makes it necessary to obtain a minimum of three years' grazing before planting it to rice, because production in the first year is about two-thirds that of the second and third years.

Kobe lespedeza is well adapted to the rice area and is highly suitable both for summer grazing and for the production of hay, whereas common lespedeza appears to be desirable only for grazing.

Oats appear to be the most suitable crop for winter grazing; however, extreme difficulty is sometimes encountered owing to high rainfall and poor drainage in rice soils. Good surface drainage and controlled grazing are essential if maximum yields of both beef and grain are to be obtained.

Although Atlas 66 wheat was not included in these experiments, other tests indicate that it is highly suitable for both winter grazing and feed grain production.

It is quite evident that a long-time rotation of improved pasture and rice is superior to the most common rotation of one year rice followed by one year native pasture as practiced in southwest Louisiana. More rice can be produced by using improved pasture rotations on fewer acres, and at less cost, than can be produced on the one-year-rice, one-year-pasture rotation, and these rotations, if generally adopted, would greatly expand the cattle industry in the rice area as well as improve the quality of cattle produced. The effect of this would be to promote more stability in the agricultural economy of southwest Louisiana by reducing the farmers' dependence on rice, especially during periods of surplus and low prices.

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Pastures for Profit In Southwest Louisiana

1. In planning a pasture program for maximum production of good quality beef, consider these requirements: 1 acre of improved pasture, 0.9 acre of winter pasture, 0.3 acre for hay crop and 0.2 acre for harvested grain per mature animal.

2. For improved pastures plant a mixture of Louisiana S-1 white clover, Dallis grass and lespedeza on a well-prepared seedbed that has been well fertilized and limed where necessary. These pastures may be overseeded with rye grass each fall.

3. Plant oats and wheat for winter grazing and for grain production.

4. Plant lespedeza in late February for hay production.

5. Provide small levees for irrigation as needed and insure adequate drainage, especially during the winter months.

6. Use adequate fertilizer on all pasture, grain and hay crops.

7. Practice controlled grazing.

8. Consult your County Agent or Experiment Station for further information.